

WHAT IS CLAIMED IS:

- 1 1. A refurbisher for treating at least one intervertebral disc, said
2 refurbisher comprising:
 - 3 (a) a ribbon-like energy application head having an energy application
4 region and a tissue protecting region; and
 - 5 (b) a control member operationally connected to said ribbon-like
6 energy application head, said control member suitable for
7 controlling said ribbon-like energy application head during
8 treatment of said at least one intervertebral disc.
- 1 2. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head is expandable and contractible.
- 1 3. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head has at least one energy transmission layer.
- 1 4. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head has at least one heat generation layer.
- 1 5. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head has at least one insulation layer.
- 1 6. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head has at least one layer for deflecting the overlying dural sac and nerve
3 roots to protect them from the effects of the thermal treatment.
- 1 7. The refurbisher of claim 1 wherein said ribbon-like energy
2 application head has at least one expandable and contractable layer.

1 8. The refurbisher of claim 1, said ribbon-like energy application head
2 further comprising:

- 3 (a) a bottom layer having a heat generator therein;
4 (b) a middle layer providing thermal insulation; and
5 (c) a top layer for deflecting the overlying dural sac and nerve roots to
6 protect them from the effects of the thermal treatment.

1 9. An apparatus for treating at least one intervertebral disc, said
2 apparatus comprising:

- 3 (a) an expandable and contractible energy application head having an
4 energy application region and a tissue protecting region; and
5 (b) said energy application head having a distance between said
6 energy application region and said tissue protecting region wherein
7 said distance is variable to protect tissue associated with said at
8 least one intervertebral disc.

1 10. The apparatus of claim 9, said energy application head further
2 comprising:

- 3 (a) smooth, rounded edges;
4 (b) a domed center section; and
5 (c) said edges sloped to said domed center section;
6 (d) wherein said energy application head has a wedge-shaped head
7 geometry.

1 11. The apparatus of claim 9, wherein said energy application head is a
2 ribbon-like energy application head having an energy application region and a tissue
3 protecting region.

1 12. The apparatus of claim 9, said energy application region is selected
2 from the group consisting of:

- 3 (a) a flexible energy application region;
4 (b) a flat energy application region;
5 (c) an concave energy application region;
6 (d) a convex energy application region; and
7 (e) a malleable energy application region.

1 13. The apparatus of claim 9, said distance between said energy
2 application region and said tissue protecting region being variable in proportion to the
3 amount of energy being delivered to the intervertebral disc.

1 14. The apparatus of claim 9, said distance between said energy
2 application region and said tissue protecting region being automatically variable.

1 15. The apparatus of claim 9, said distance between said energy
2 application region and said tissue protecting region being manually variable.

1 16. The apparatus of claim 9, said distance between said energy
2 application region and said tissue protecting region being variable by mechanically
3 expanding and contracting said expandable and contractible energy application head.

1 17. The apparatus of claim 9 further including an inflatable portion for
2 expanding and contracting said expandable and contractible energy application head.

- 1 18. An energy application device, said device comprising:
2 (a) an energy application head having an energy application region
3 and a tissue protecting region;
4 (b) a distance between said energy application region and said tissue
5 protecting region;
6 (c) said energy application head having a contracted state in which
7 said distance is a minimum distance;
8 (d) said energy application head having an expanded state in which
9 said distance is a protecting distance greater than said minimum
10 distance; and
11 (e) means for varying said distance between said minimum distance
12 and said protecting distance.

1 19. The device of claim 18, said energy application head further
2 comprising:

- 3 (a) smooth, rounded edges;
4 (b) a domed center section; and
5 (c) said edges sloped to said domed center section;
6 (d) wherein said energy application head has a wedge-shaped head
7 geometry.

1 20. The device of claim 18, wherein said energy application head is a
2 ribbon-like energy application head having an energy application region and a tissue
3 protecting region.

1 21. A method for thermally treating an intervertebral disc while
2 thermally protecting vulnerable tissues, said method comprising the steps of:
3 (a) gaining access to a vertebral column;
4 (b) epidurally approaching the posterior aspect of said at least one
5 intervertebral disc with an energy application head having an
6 energy application region, a tissue protecting region, and a distance
7 defined between said energy application region and said tissue
8 protecting region;
9 (c) varying said distance to protect tissue associated with said at least
10 one intervertebral disc to maintain a safe temperature in vulnerable
11 tissues near said at least one intervertebral disc; and
12 (d) applying energy to a posterior aspect of said at least one
13 intervertebral disc while maintaining a safe temperature in said
14 vulnerable tissues near said at least one intervertebral disc.

1 22. The method of claim 21, further comprising at least one step
2 selected from the group of steps consisting of:
3 (a) evaluating an extent of disc injury;
4 (b) calculating an amount of energy needed to refurbish thermally said
5 at least one intervertebral disc;
6 (c) monitoring an amount of energy delivered and a temperature in
7 vulnerable tissues around said at least one intervertebral disc;
8 (d) observing and evaluating an amount of shrinkage and
9 strengthening of said at least one intervertebral disc to determine
10 an intensity and duration of further energy delivery; and
11 (e) verifying that said shrinkage and strengthening of said at least one
12 intervertebral disc is mechanically successful.